

REMARKS

Request for Examiner Interview.

If the Examiner's position is that this Response does not place the application in a condition for allowance, Applicant hereby requests an Examiner Interview to discuss the outstanding rejections **prior to issuance of another action** by the Examiner. It is noted that 1) the Applicant requested an Examiner Interview in the Amendment filed on August 31, 2005; 2) An Applicant Initiated Interview Request Form requesting an Examiner Interview was filed on August 31, 2005; 3) a voicemail message was left with the Examiner requesting an Examiner Interview on January 4, 2006; and 4) voicemail messages were left with the Examiner and the Examiner's Supervisor, Kakali Chaki, requesting an Examiner Interview on January 6, 2006. However, the Examiner failed to respond to any of the Examiner interview requests.

1/2) Claims 1-5, 10-11, 14, 17-18, 21, and 27-29 are novel over Goebel (5,901,317).

Claim 1 recites:

A method comprising:
adding direction to interference edges of a register interference graph, wherein each interference edge extends between two nodes of said register interference graph, said adding direction comprising:
for each node of each interference edge,
determining whether a variable associated with said node was live when an other variable associated with the other node of said two nodes was defined or used;
wherein upon a determination that said variable associated with said node was live when said other variable associated with said other node was defined or used, said first node is a primary node; and
defining an interference edge adjacent a primary node as a pass edge;
defining a pass degree of each node as the number of pass edges of said node; and

choosing a node of said register interference graph to spill based upon said pass degree of said node. (Emphasis added.)

As set forth by Applicant at page 9 of the Amendment filed on August 31, 2005:

Assuming for purposes of argument only, that "a vector, by definition, has direction", **the Examiner has failed to callout where Goebel teaches or suggests why a vector would have direction or in which direction the vector would go.** (Emphasis added.)

In response to the Applicant's argument, the Examiner states:

Therefore, contrary to the applicants suggestion that Goebel does not teach or suggest adding direction, the terms vector, edges and graph, as well as their inherent references to other terms such as tree and line, is considered sufficient to indicate the claimed feature of **adding direction to edges.** (Office Action, page 3, emphasis in original.)

Assuming for purposes of argument only that Goebel teaches "adding direction to edges", the Examiner has failed to callout where Goebel teaches or suggests in which direction the edges would go. Specifically, as stated above, Claim 1 recites:

... said adding direction comprising:

...
wherein upon a determination that said variable associated with said node was live when said other variable associated with said other node was defined or used, said first node is a primary node; ...

The Examiner asserts the Goebel teaches this feature of Claim 1 at "see col. 2 lines 25-48" at page 3 of the Office Action. However, Goebel teaches at col. 2, lines 25-48:

From a system standpoint, the invention comprises a data processing system having a CPU with a fixed number of allocatable registers, and a compiler including a first procedure for creating a primary interference graph having nodes representing virtual registers and **primary edges linking nodes with concurrent latency**, the number of edges of a given node being the degree of the node, a second procedure for creating a second interference graph having nodes representing virtual registers and **secondary edges linking nodes with conditional conflicts**, a third procedure for selecting nodes from the primary interference graph having a degree less than the number of CPU registers until all nodes have been selected from the primary interference graph, and a fourth procedure for allocating real registers to the selected nodes by first determining whether a register can be allocated for a selected node using the edges of both the primary and secondary interference graphs and, if so, allocating a real register on that basis; and, if not, allocating a real register using the edges of the primary graph alone. The allocating procedure is performed on nodes in the reverse order from which the nodes were originally selected. In a specific embodiment of the procedures, the secondary interference graph edges link a virtual register requiring use of a paired register with another virtual register having common latency. (Emphasis added.)

Thus, at col. 2, lines 25-48, Goebel teaches "primary edges" and "secondary edges". Applicant respectfully submits the Examiner has failed to callout where at col. 2, lines 25-48 Goebel teaches or suggests:

wherein upon a determination that said variable associated with said node was live when said other variable associated with said other node was defined or used, said first node is a primary node,

as recited in Claim 1 and Applicant requests clarification.

The Examiner further asserts:

defining an interference **graph** ... see col. 3 lines 28-40. (Office Action, page 3, emphasis added.)

Thus, the Examiner recites "an interference **graph**" yet Claim 1 recites:

defining an interference **edge** adjacent a primary node as a pass edge; (emphasis added.)

Accordingly, the Examiner has failed to callout this feature of Claim 1.

Further, at col. 3 lines 28-40, Goebel teaches:

Once the graph has been constructed, real register assignments or "coloring" is attempted using both the primary and secondary components of the interference graph. FIG. 2 is a flow chart illustrating the overall process. As seen in this figure, **the register allocation technique of the present invention begins with a step of building the primary interference graph and the secondary interference graph in step 22.** Next, a check is made to determine whether there is a node in the primary interference graph only having a degree less than the number of machine registers. If not, then a conventional spill routine 25 is entered, and a new primary and secondary interference graph are constructed in a second pass through step 22. (Emphasis added.)

Thus, as asserted by the Examiner, Goebel at col. 3 lines 28-40 discusses "defining an interference **graph**". Applicant respectfully submits the Examiner has failed to callout where at col. 3 lines 28-40 Goebel teaches or suggests:

defining an interference edge adjacent a primary node as a pass edge,

as recited in Claim 1 and Applicant requests clarification.

The Examiner further asserts:

Goebel chooses a node ... to spill based upon a pass degree of said node Col. 3 lines 28-40; in which **the pass degree is considered specified via the applicants specifications**, sects. 0021-0025. (Office Action, page 4, emphasis added.)

The Examiner's statement is respectfully traversed. Both Applicant's specification and Goebel teach that the degree of a

node is equal to the number of interference edges of the node.

Thus, both Applicant's specification and Goebel teach away from:

defining an interference edge adjacent a
primary node as a pass edge;
defining a pass degree of each node as the number
of pass edges of said node; and
choosing a node of said register interference graph
to spill based upon said pass degree of said node,

as recited in Claim 1, emphasis added.

To illustrate, at paragraph [0021] (page 5, lines 10-11 of the Application as filed) of Applicant's specification, it is set forth:

The degree of a node is equal to the number of
interference edges of the node.

Similarly, in Goebel at col. 2, lines 3-4:

... the number of edges of a given node being termed the
degree of the node.

As set forth at MPEP 2141.02 at page 2100-132, 8th edition, Rev. 3, August 2005:

PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING
DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS.

For the above reasons, Claim 1 is allowable over Goebel. Claims 2-5, 10, which depend from Claim 1, are allowable for at least the same reasons as Claim 1. Claims 11, 14, 17 and 27 are allowable for reasons similar to Claim 1. Claims 18, 21, which depend from Claim 17, are allowable for at least the same reasons as Claim 17. Claims 28 and 29, which depend from Claim 27, are allowable for at least the same reasons as Claim 27.

For the above reasons, Applicant respectfully requests reconsideration and withdrawal of this rejection.

3-4) Claim 6-9, 19-20, 22-26 are patentable over Goebel.

As set forth above, Claims 1 and 17 are allowable over Goebel. Claim 6-9 and Claims 19-20, 22-26, which depend from Claims 1 and 17, respectively, are allowable over Goebel for at least the same reasons as Claims 1 and 17.

Further, regarding Claim 6, the Examiner states:

The choice of which edge is adjacent to another is not considered a part of the invention; but, merely a result of coincidence or chance. Therefore, Goebel is considered to provide for the Feature, see fig. 1. (Office Action, pages 6-7).

The Examiner's statement is respectfully traversed. As noted above, Claim 1, from which Claim 6 depends, sets forth:

defining an interference edge adjacent a primary node as a pass edge;
defining a pass degree of each node as the number of pass edges of said node; and
choosing a node of said register interference graph to spill based upon said **pass degree** of said node.
(Emphasis added.)

Dependent Claim 6 sets forth:

The method of Claim 4 wherein an end of said interference edge adjacent said first node comprises a pass edge and wherein an end of said interference edge adjacent said second node comprises a non-pass edge.
(Emphasis added.)

As set forth in MPEP § 2143 at page 2100-135, 8th edition, Rev. 3, August 2005, under Basic Requirements of a *Prima Facie* Case of Obviousness:

... Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations.** (Emphasis added.)

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Reply to Office Action of October 11, 2005

As the Examiner has failed to callout where Goebel teaches or suggests the features of Claim 6, Claim 6 is allowable over Goebel.

For the above reasons, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Conclusion

Claims 1-11, 14, 17-29 are pending in the application. For the foregoing reasons, Applicant respectfully requests allowance of all pending claims. If the Examiner has any questions relating to the above, the Examiner is respectfully requested to telephone the undersigned Attorney for Applicant(s).

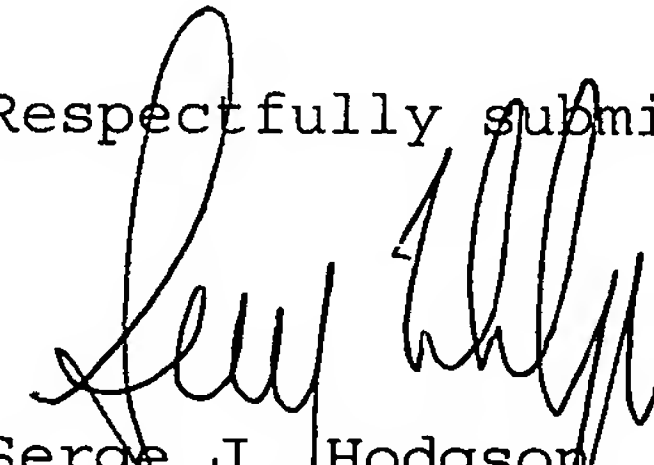
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 11, 2006.


Attorney for Applicant(s)

January 11, 2006
Date of Signature

Respectfully submitted,


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